FORM PTO-1390 (Modified) U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE
(REV 10-95)

TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371

ATTORNEY'S DOCKET NUMBER: **1685**

U.S. APPLICATION NO. (IF KNOWN, SEE 37 CFR): 09/890198

INTERNATIONAL APPLICATION NO.	INTERNATIONAL FILING DATE	PRIORITY DATE CLAIMED
PCT/DE 00/04083	**NOVEMBER 18, 2000**	**DECEMBER 3, 1999**

TITLE OF INVENTION
WINDOW WIPER, IN PARTICULAR FLAT BEAM WINDOW WIPER FOR VEHICLE

APPLICANT(S) FOR DO/EO/US
Joerg HUBER, Manfred WILHELM, Julius MAZURKIEWICZ

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. ☐ This is an express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(1).
4. ☐ A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.
5. ☒ A copy of the International Application as filed (35 U.S.C. 371 (c) (2))
   a. ☐ is transmitted herewith (required only if not transmitted by the International Bureau).
   b. ☒ has been transmitted by the International Bureau.
   c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US).
6. ☒ A translation of the International Application into English (35 U.S.C. 371(c)(2)).
7. ☐ A copy of the International Search Report (PCT/ISA/210).
8. ☐ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371 (c)(3))
   a. ☐ are transmitted herewith (required only if not transmitted by the International Bureau).
   b. ☐ have been transmitted by the International Bureau.
   c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
   d. ☐ have not been made and will not be made.
9. ☐ A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
10. ☒ An oath or declaration of the inventor(s) (35 U.S.C. 371 (c)(4)).
11. ☐ A copy of the International Preliminary Examination Report (PCT/IPEA/409).
12. ☐ A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371 (c)(5)).

Items 13 to 18 below concern document(s) or information included:

13. ☒ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
14. ☒ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
15. ☒ A **FIRST** preliminary amendment.
    A **SECOND** or **SUBSEQUENT** preliminary amendment.
16. ☐ A substitute specification.
17. ☐ A change of power of attorney and/or address letter.
18. ☒ Certificate of Mailing by Express Mail
19. ☐ Other items or information:

EL 364016655 US

U.S. APPLICATION NO. (IF KNOWN, SEE 37 CFR)	INTERNATIONAL APPLICATION NO.	ATTORNEY'S DOCKET NUMBER
09/890198	PCT/DE 00/04083	1685

20. The following fees are submitted:.

BASIC NATIONAL FEE (37 CFR 1.492 (a) (1) - (5)) :

		CALCULATIONS PTO USE ONLY
☐	Search Report has been prepared by the EPO or JPO	**$930.00**
☐	International preliminary examination fee paid to USPTO (37 CFR 1.482)	**$720.00**
☐	No international preliminary examination fee paid to USPTO (37 CFR 1.482) but international search fee paid to USPTO (37 CFR 1.445(a)(2))	**$790.00**
☒	Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2) paid to USPTO	**$1,070.00**
☐	International preliminary examination fee paid to USPTO (37 CFR 1.482) and all claims satisfied provisions of PCT Article 33(2)-(4)	**$98.00**

ENTER APPROPRIATE BASIC FEE AMOUNT =	**$1,000.00**	
Surcharge of **$130.00** for furnishing the oath or declaration later than ☐ 20 ☐ 30 months from the earliest claimed priority date (37 CFR 1.492 (e)).	**$0.00**	

CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE		
Total claims	6 - 20 =	0	x $18.00	**$0.00**	
Independent claims	1 - 3 =	0	x $80.00	**$0.00**	
Multiple Dependent Claims **(check if applicable).**			☐	**$0.00**	
TOTAL OF ABOVE CALCULATIONS =				**$1,000.00**	
Reduction of 1/2 for filing by small entity, if applicable. Verified Small Entity Statement must also be filed (Note 37 CFR 1.9, 1.27, 1.28) **(check if applicable).**			☐	**$0.00**	
SUBTOTAL =				**$1,000.00**	
Processing fee of **$130.00** for furnishing the English translation later than ☐ 20 ☐ 30 months from the earliest claimed priority date (37 CFR 1.492 (f)).			+	**$0.00**	
TOTAL NATIONAL FEE =				**$1,000.00**	
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31) **(check if applicable).**			☒	**$40.00**	
TOTAL FEES ENCLOSED =				**$1,040.00**	
				Amount to be: refunded	$
				charged	$

☐ A check in the amount of to cover the above fees is enclosed.

☒ Please charge my Deposit Account No. **19-4675** in the amount of **$1,040.00** to cover the above fees.
A duplicate copy of this sheet is enclosed.

☒ The Commissioner is hereby authorized to charge any fees which may be required, or credit any overpayment to Deposit Account No. **19-4675** A duplicate copy of this sheet is enclosed.

NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.

SEND ALL CORRESPONDENCE TO:

STRIKER, STRIKER & STENBY
103 EAST NECK ROAD
HUNTINGTON, NEW YORK 11743

SIGNATURE

MICHAEL J. STRIKER
NAME

27233
REGISTRATION NUMBER

JULY 26, 2001
DATE

UNITED STATES PATENT AND TRADEMARK OFFICE

Examiner: Group: Attorney Docket # 1685

Applicant(s) : HUBER, J.,E T AL

Serial No. :

Filed : Simultaneously

For : WINDOW WIPER, IN PARTICULAR FLAT BEAM WINDOW WIPER FOR VEHICLE

SIMULTANEOUS AMENDMENT

July 26, 2001

Honorable Commissioner of Patents and Trademarks
Washington, D.C. 20231

S I R S:

Simultaneously with filing of the above identified application please amend the same as follows:

In the Claims:

Cancel all claims without prejudice.

Substitute the claims attached hereto.

REMARKS:

This Amendment is submitted simultaneously with filing of the above identified application.

With the present Amendment applicant has amended the claims so as to eliminate their multiple dependency.

Consideration and allowance of the present application is most respectfully requested.

Respectfully submitted,

Michael J. Striker
Attorney for Applicant(s)
Reg. No. 27233

Claims

1. Window wiper, in particular flat beam window wiper for vehicles, having a spring strip back (10) that exhibits a variable strip thickness (d) across the length of the back (l), having a connecting device (11) situated in the middle on the spring strip back (10) for a wiper arm (12), and having a rubber-elastic wiper strip (13) fastened to the spring strip back (10), characterized in that the spring strip back (10) is refined in such a way that it exhibits a quasi constant course of strength or hardness along the length of the back.

2. Window wiper according to Claim 1, characterized in that the spring strip back (10) is heated to a hardening temperature in a continuous operation, then quenched and, to temper it, heated to a tempering temperature in such a way that it does not reach the tempering temperature until immediately before it leaves the tempering zone.

3. Window wiper according to Claim 2, characterized in that the tempering zone is divided into multiple temperature zones, and that the spring strip back (10) is moved through the temperature zone in such a way that it passes through the temperature zone last that brings about the tempering temperature.

4. Window wiper according to Claim 3, characterized in that the length of the last temperature zone in the pass-through direction of the spring strip back (10) is coordinated with the pass-through speed of the spring strip back (10) in such a way that the spring strip material reaches the tempering temperature as late as possible.

5. Window wiper according to [one of the Claims 2 through 4] Claim 2, characterized in that the spring strip back is heated using thermal radiation.

6. Window wiper according to [one of the Claims 3 through 5] Claim 3, characterized in that the last temperature zone in the pass-through direction of the spring strip back (10) is thermally well isolated from the preceding temperature zones.

Claims

1. Window wiper, in particular flat beam window wiper for vehicles, having a spring strip back (10) that exhibits a variable strip thickness (d) across the length of the back (l), having a connecting device (11) situated in the middle on the spring strip back (10) for a wiper arm (12), and having a rubber-elastic wiper strip (13) fastened to the spring strip back (10), characterized in that the spring strip back (10) is refined in such a way that it exhibits a quasi constant course of strength or hardness along the length of the back.

2. Window wiper according to Claim 1, characterized in that the spring strip back (10) is heated to a hardening temperature in a continuous operation, then quenched and, to temper it, heated to a tempering temperature in such a way that it does not reach the tempering temperature until immediately before it leaves the tempering zone.

3. Window wiper according to Claim 2, characterized in that the tempering zone is divided into multiple temperature zones, and that the spring strip back (10) is moved through the temperature zone in such a way that it passes through the temperature zone last that brings about the tempering temperature.

4. Window wiper according to Claim 3, characterized in that the length of the last temperature zone in the pass-through direction of the spring strip back (10) is coordinated with the pass-through speed of the spring strip back (10) in such a way that the spring strip material reaches the tempering temperature as late as possible.

5. Window wiper according to Claim 2, characterized in that the spring strip back is heated using thermal radiation.

6. Window wiper according to Claim 3, characterized in that the last temperature zone in the pass-through direction of the spring strip back (10) is thermally well isolated from the preceding temperature zones.

WINDOW WIPER, IN PARTICULAR FLAT BEAM WINDOW WIPER FOR VEHICLES

Related Art

The invention is based on a window wiper, in particular flat beam window wiper for vehicles, of the class defined in the preamble of Claim 1.

So-called flat beam window wipers are made known, for instance, in US 3 192 551. In them, a single spring strip back, on the middle connecting device of which the wiper arm of the window wiper grips, creates a constant pressure of the rubber wiper strip fastened to the back against the usually curved surface of the front window or windshield of the vehicle across the entire wiping range. To this end, the bent spring strip back has a material strength that changes along its length, is at a maximum in the middle of the back and decreases toward both ends of the back.

Advantages of the Invention

The window wiper according to the invention having the features of Claim 1 has the advantage that, as a result of the quasi constant course of hardness along the length of the spring strip back, the latter can be bent evenly and equally well in all sections, and an optimal course of the pressing force acting on the wiper strip can therefor be set for front vehicle windows having different curvatures.

Advantageous further developments and improvements of the window wiper indicated in Claim 1 are possible using the measures listed in the further claims.

According to a preferred embodiment of the invention, the spring strip back is heated to the required hardening temperature in a continuous operation, then

quenched and, to temper it, heated to a tempering temperature in such a way that it does not reach the tempering temperature until immediately before leaving the tempering zone. In this fashion, the largely constant course of strength is achieved reliably and reproducibly in the continous operation. Due to the fact that the tempering temperature is not reached until “as late as possible”, the dwell time of the spring strip material at the tempering temperature is extremely low and the final hardness of the spring strip back is determined solely by the tempering temperature, while the dwell time does not influence the final hardness.

In order to realize the aforementioned requirement of an extremely short dwell time of the spring strip material at the tempering temperature in a simple fashion, the tempering zone for the spring strip back is divided into multiple temperature zones, and the spring strip back is moved through the temperature zones in such a way that it passes through the temperature zone last that brings about the tempering temperature. As a result of the prewarming of the spring strip back achieved in this fashion to temperatures below the actual tempering temperature, the spring strip material is already heated in such a way that, in the last temperature zone, the tempering temperature is achieved nearly equally quickly in the thick as well as the thin sections of the spring strip back and, therefore, the dwell time at the tempering temperature is approximately the same for all strip sections.

According to a preferred embodiment of the invention, this rapid heating of the spring strip back to the tempering temperature in the last temperature zone is achieved using thermal radiation and a short pathway of action for this thermal radiation upon the spring strip back. In this process, a good thermal isolation of the last temperature zone from the preceding temperature zone is an advantage.

Drawing

The invention is explained in greater detail in the description below using a design example shown in the drawing.

Figure 1 shows a side view of a flat beam window wiper.

Figure 2 shows a side view of a spring strip back of the flat beam window wiper in Figure 1 prepared for its refinement.

Figure 3 shows a diagram of the course of thickness and hardness along the length of a spring strip back refined using traditional means.

Figure 4 shows a similar diagram of the course of thickness and hardness along the length of the spring strip back refined according to the invention.

Figure 5 shows a similar illustration as in Figure 4 of a spring strip back refined according to the invention with a higher hardness specification.

Description of the Design Example

The flat beam window wiper shown in a side view in Figure 1 as a design example for a window wiper for motor vehicles has a curved spring strip back 10 that has a connecting device 11 in the middle for a wiper arm 12 indicated in Figure 1 using a dash-dotted line and which is combined with a rubber-elastic wiper strip 13. The spring strip back 10 is curved using a rolling and bending procedure, for instance, and has a variable strip thickness or material strength d along the length of the back 1, as illustrated in Figure 2. The strip thickness d is greatest in the middle of the spring strip back 10 and decreases continuously toward both ends of the spring strip back 10. The rubber-elastic wiper strip 13 can be applied in such a fashion that the spring strip back 10 is pressed in a level

position, and the wiper strip 13 is adhered or vulcanized to the concave side in the unloaded state. In the operating state, the window wiper lies with the wiper strip 13 under a certain pressing force against the front window or windshield of the vehicle indicated by number 14 in Figure 1 and is set into a swivel motion by the wiper arm 12 in a known fashion by a wiper drive, so that the wiper edge 131 of the wiper strip 13 is moved across the window.

The spring strip back 10 is refined and, despite its varying strip thickness d along the length of the back l, exhibits a nearly constant course of strength or hardness (H) along the length of the strip l. In order to reproducibly ensure this quasi constant course of hardness using production engineering, the spring strip back 10 is refined (hardened and tempered) in a continuous operation in such a fashion that it is heated to a required hardening temperature, then quenched and, to temper it, heated to a tempering temperature in such a way that it does not reach the tempering temperature until immediately before it leaves the tempering zone. In order to make the continuous operation possible, a plurality of spring strip backs 10 are combined in one spring strip 15, as shown in sections in a side view in Figure 2. After refinement, the spring strip 15 is cut through at the separating points 16, so that the refined spring strip backs 10 are available individually.

While the hardening of the spring strip 15 takes place in known fashion, when the spring strip 15 is tempered, each spring strip back 10 is heated while the spring strip 15 passes through the tempering zone in such a way that its strip material reaches the tempering temperature as late as possible, i.e., not until immediately before leaving the tempering zone. The dwell time of the strip material at the tempering temperature is therefore extremely short, so that the dwell time cannot affect the hardening result, and the final hardness of the spring strip back 10 is determined solely by the tempering temperature. In order to realize this reaching of the tempering temperature “as late as possible”, the tempering zone is divided into multiple temperature zones, and the spring strip 15 is moved through the

temperature zone in such a way that each spring strip back 10 passes through the temperature zone last that brings about the tempering temperature. In this process, the length of the last temperature zone is coordinated with the pass-through speed of the spring strip back 10 in such a way that the tempering temperature is reached immediately before the spring strip back 10 leaves this temperature zone. To accomplish this, the spring strip back 10 is prewarmed in the last temperature zone using thermal radiation and heated to a temperature below the tempering temperature in the preceding temperature zones, so that the heating to tempering temperature is achieved very quickly using thermal radiation in the preferably thermally isolated, final heating zone.

The diagrams in Figures 3 and 4 show the result of refinement of a spring strip back 10 refined according to the invention as compared to a spring strip back 10 refined using a traditional method. Each of the curves 1 represents the course of thickness of the spring strip back 10 along the length of the back. The curves 2 show the course of strength or hardness (H values) along the length of the back. It is clear to see that, in Figure 3, the hardness values fluctuate with the strip thickness, and the sections with lower strip thickness have lower H values than the secitons with greater strip thickness; in contrast, the course of H values along the length of the back in Figure 4 is roughly constant and, therefore, the thinner strip sections have approximately the same H values as the thicker strip sections.

In the cases shown in Figures 3 and 4, the spring strip back 10 was exposed to approximately the same hardening temperature. The tempering temperature in the case shown in Figure 3 was constant and lay at a higher temperature level than in the case shown in Figure 4. The tempering temperature in the case shown in Figure 4, in the temperature zones preceding the last temperature zone, was lower than the required tempering temperature.

The only difference between the diagram shown in Figure 5 and the diagram shown in Figure 4 is that a higher hardening specification was targeted for the

spring strip back 10. The hardening temperature for the spring strip back according to Figure 5 was dimensioned to the same extent as in the case shown in Figure 4 and was constant. The tempering temperature was reduced considerably, and the temperature difference between the preceding temperature zones and the tempering temperature caused in the last temperature zone was reduced.

Claims

1. Window wiper, in particular flat beam window wiper for vehicles, having a spring strip back (10) that exhibits a variable strip thickness (d) across the length of the back (l), having a connecting device (11) situated in the middle on the spring strip back (10) for a wiper arm (12), and having a rubber-elastic wiper strip (13) fastened to the spring strip back (10), characterized in that the spring strip back (10) is refined in such a way that it exhibits a quasi constant course of strength or hardness along the length of the back.

2. Window wiper according to Claim 1, characterized in that the spring strip back (10) is heated to a hardening temperature in a continuous operation, then quenched and, to temper it, heated to a tempering temperature in such a way that it does not reach the tempering temperature until immediately before it leaves the tempering zone.

3. Window wiper according to Claim 2, characterized in that the tempering zone is divided into multiple temperature zones, and that the spring strip back (10) is moved through the temperature zone in such a way that it passes through the temperature zone last that brings about the tempering temperature.

4. Window wiper according to Claim 3, characterized in that the length of the last temperature zone in the pass-through direction of the spring strip back (10) is coordinated with the pass-through speed of the spring strip back (10) in such a way that the spring strip material reaches the tempering temperature as late as possible.

5. Window wiper according to one of the Claims 2 through 4, characterized in that the spring strip back is heated using thermal radiation.

6. Window wiper according to one of the Claims 3 through 5, characterized in that the last temperature zone in the pass-through direction of the spring strip back (10) is thermally well isolated from the preceding temperature zones.

Abstract

In a window wiper, in particular flat beam window wiper for vehicles, having a spring strip back (10) with a variable strip thickness along the length of the back, having a connecting device (11) situated in the middle on the spring strip back (10) for a wiper arm (12), and having a rubber-elastic wiper strip (13) fastened to the spring strip back (10), the spring strip back (10) is refined in such a way that it exhibits a quasi constant course of strength or hardness along the length of the back in order to ensure a consistent and equally good curvature of the curved spring strip back (10) in all sections of the spring strip back (10).

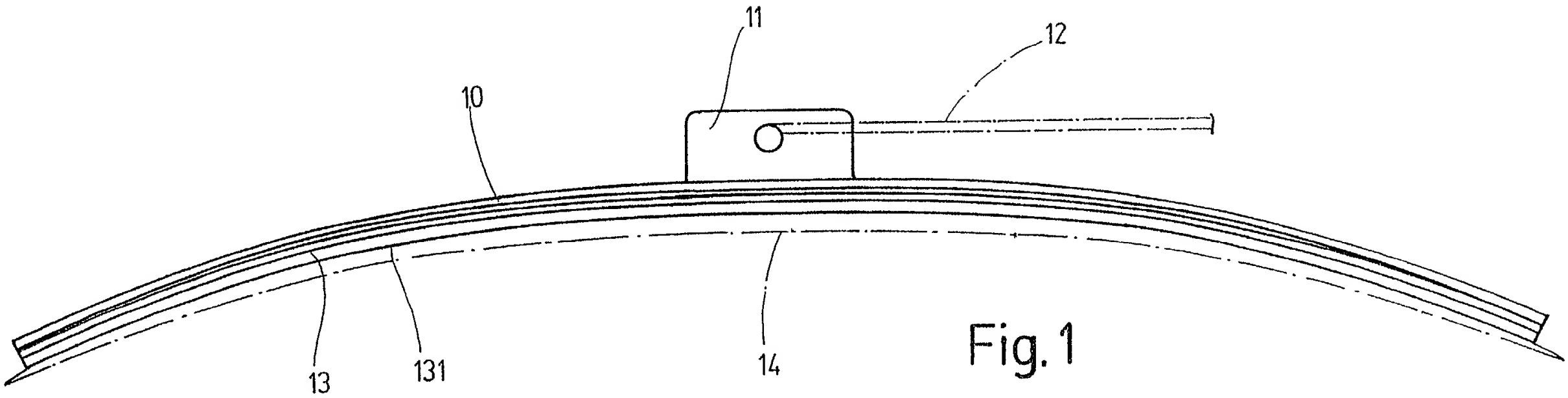

Fig. 1

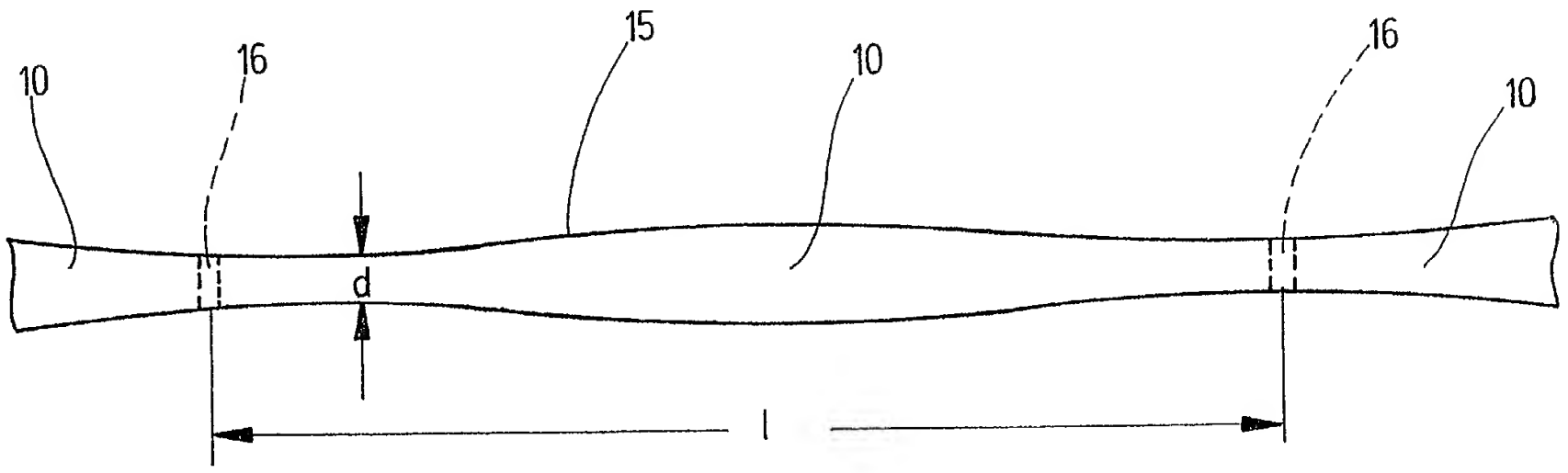

Fig. 2

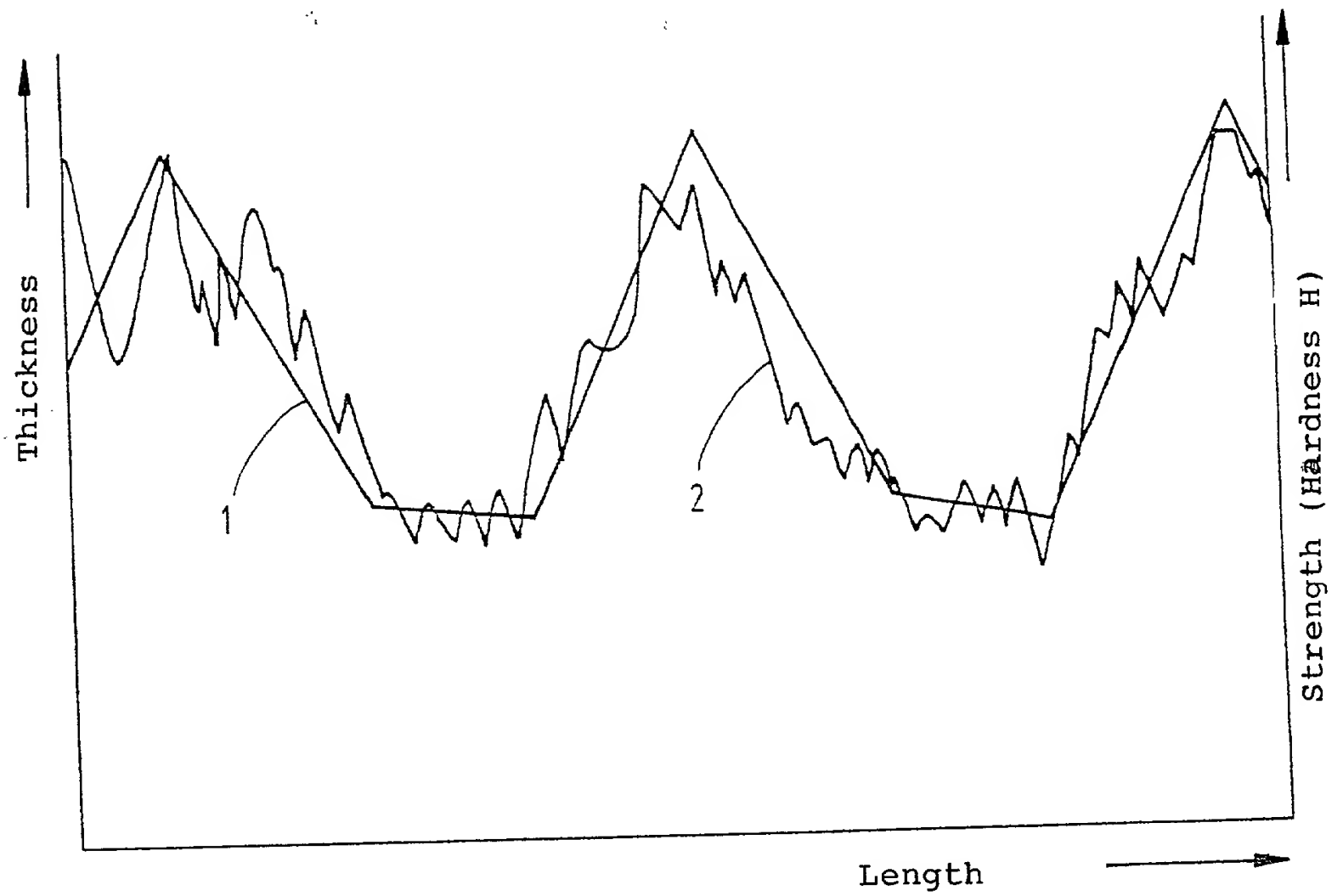

Fig. 3

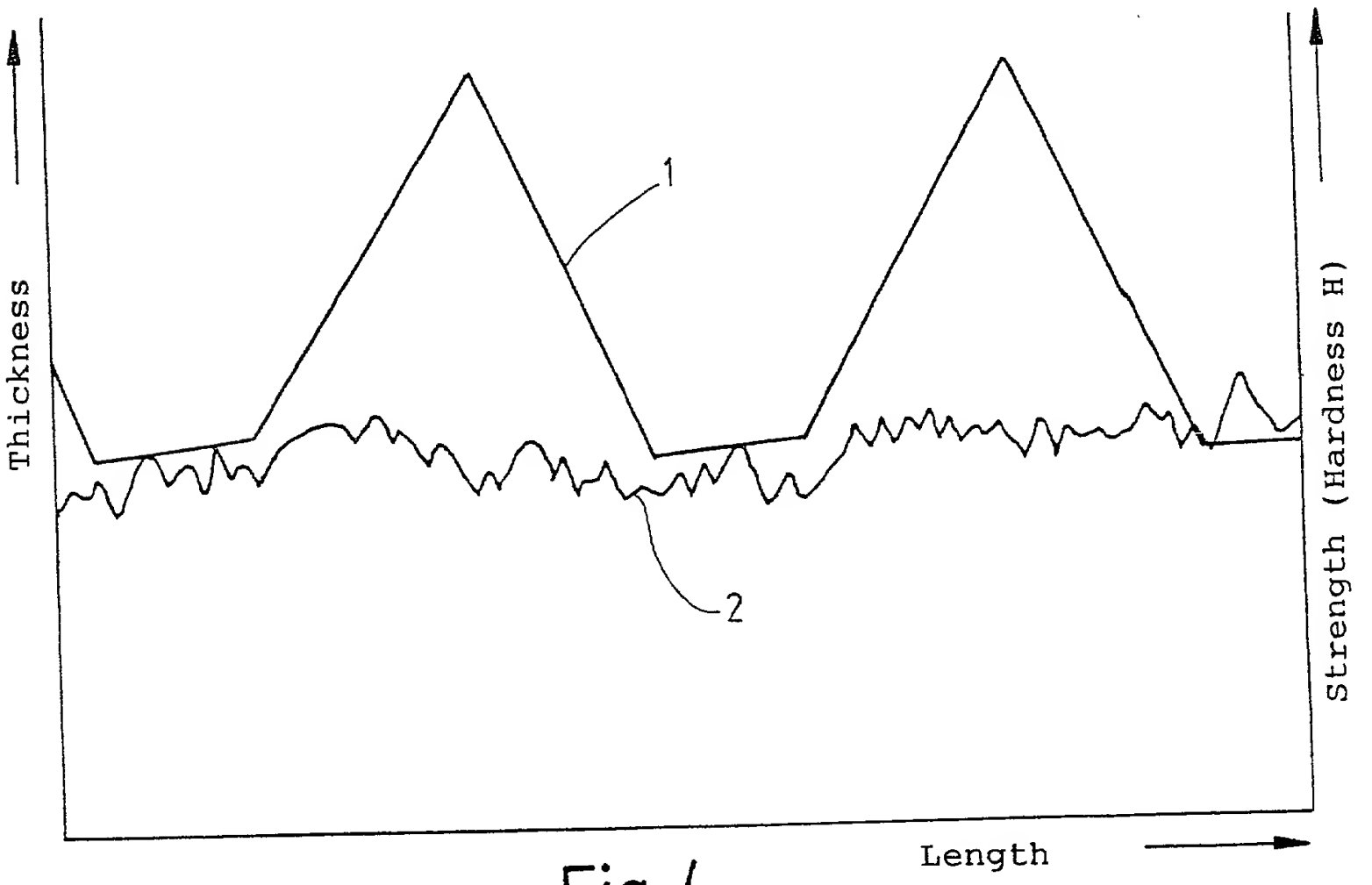

Fig. 4

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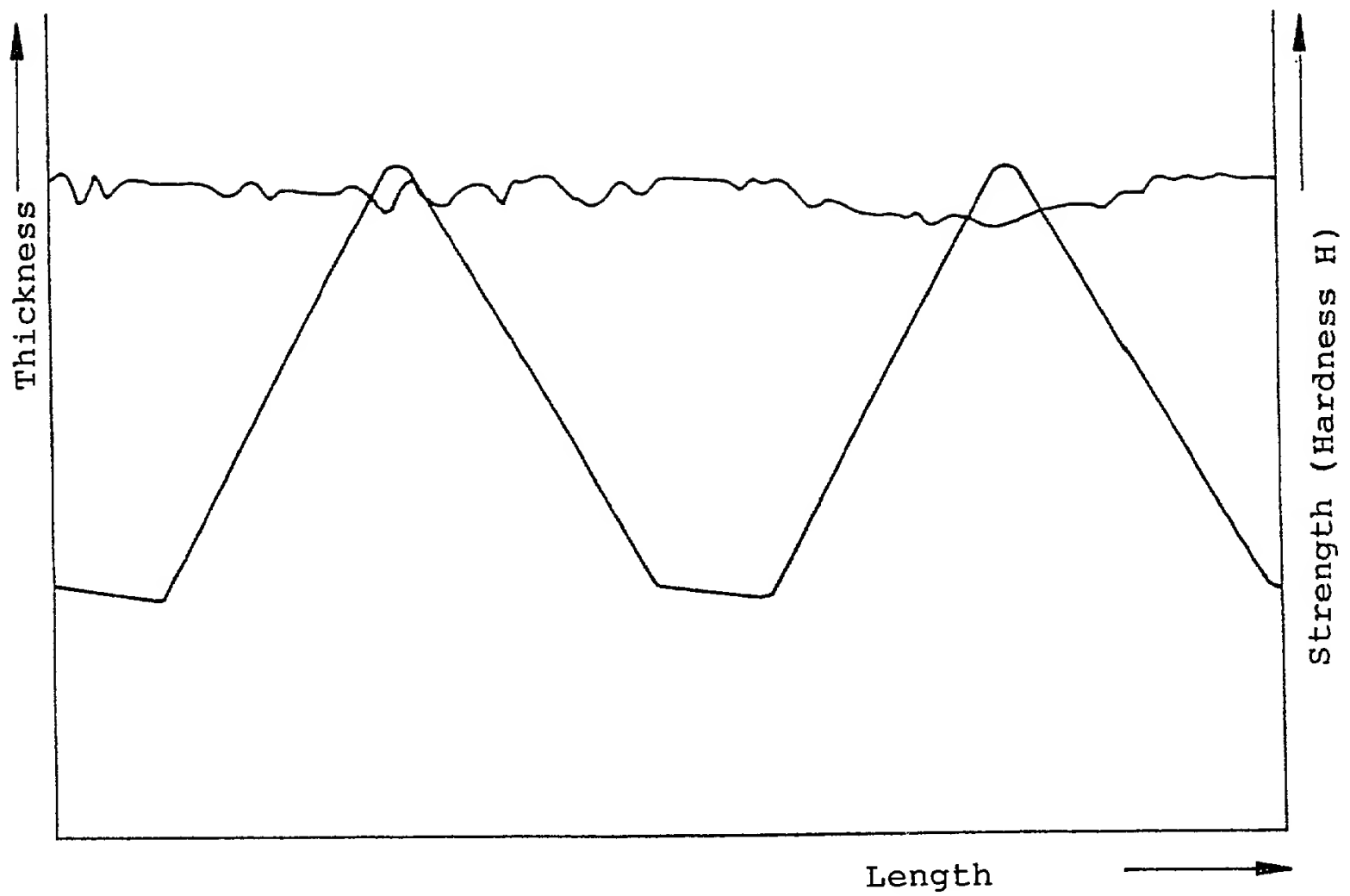

Fig. 5

09/890198

July 23, 2001

DECLARATION

The undersigned, Dana Scruggs, having an office at 7970 Sunset Cove Drive, Indianapolis, Indiana 46236, hereby states that she is well acquainted with both the English and German languages and that the attached is a true translation to the best of her knowledge and ability of PCT/DE 00/03672 of HUBER, J. ET AL., entitled "Window Wiper, in Particular Flat Beam Window Wiper for Vehicle".

The undersigned further declares that the above statement is true; and further, that this statement was made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or document or any patent resulting therefrom.

Dana Scruggs

DECLARATION AND POWER OF ATTORNEY FOR NATIONAL STAGE OF PCT PATENT APPLICATION

As a below-named inventor, I hereby declare that:

Joerg HUBER
Manfred WILHELM
Julius MAZURKIEWICZ

My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled **WINDOW WIPER, IN PARTICULAR FLAT BEAM WINDOW WIPER FOR VEHICLE** the specification of which was filed as PCT International Application number PCT/DE 00/04083 on November 18, 2000.

I hereby state that I believe the named inventor or inventors in this Declaration to be the original and first inventor or inventors of the subject matter which is claimed and for which a patent is sought.

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose all information which is material to the patentability of this application in accordance with Title 37, Code of Federal Regulations, Section 1.56.

I hereby claim foreign priority benefits under Title 35, United States Code, Section 119(a)-(d) or Section 365 (b) of any foreign application(s) for patent or inventor's certificate, or Section 365(a) of any PCT International application which designated at least one country other than the United States, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate or PCT International application having a filing date before that of the application on which priority is claimed.

Prior foreign application(s):			Priority claimed:	
199 58 386.2	GERMANY	DECEMBER 3, 1999	X	
(Number)	(Country)	(Date filed)	Yes	No
(Number)	(Country)	(Date filed)	Yes	No

As a named inventor, I hereby appoint the following attorney to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith:

Michael J. Striker, Reg. No. 27233

Direct all telephone calls to Striker, Striker & Stenby at telephone no.: (631) 549 4700 and address and all correspondence to:

STRIKER, STRIKER & STENBY
103 East Neck Road
Huntington, New York 11743
U.S.A.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that wilful false statements and the like so made are punishable by fine or imprisonment,

or both, under Section 1001 of Title 18 of the United States Code and that such wilful false statement may jeopardize the validity of the application or any patent issued thereon.

Signature: x Jörg Huber	Date: x 19.07.2001	Residence and Full Postal Address: Hindenburgstrasse 33 72762 Reutlingen DE X Germany
Full Name of First or Sole Inventor: Joerg HUBER	Citizenship: GERMAN	
Signature: x Manfred Wilhelm	Date: x 09.07.2001.	Residence and Full Postal Address: Scheffelstrasse 7 71735 Eberdingen DE X Germany
Full Name of Second Inventor: Manfred WILHELM	Citizenship: GERMAN	
Signature: x	Date: x 12.07.2001	Residence and Full Postal Address: Parelsbergstraat 69 B-3290 Diest BE X Belgium
Full Name of Third Inventor: Julius MAZURKIEWICZ	Citizenship: BELGIAN	
Signature:	Date:	Residence and Full Postal Address:
Full Name of Fourth Inventor:	Citizenship:	
Signature:	Date:	Residence and Full Postal Address:
Full Name of Fifth Inventor:	Citizenship:	
Signature:	Date:	Residence and Full Postal Address:
Full Name of Sixth Inventor:	Citizenship:	
Signature:	Date:	Residence and Full Postal Address:
Full Name of Seventh Inventor:	Citizenship:	
Signature:	Date:	Residence and Full Postal Address:
Full Name of Eighth Inventor:	Citizenship:	
Signature:	Date:	Residence and Full Postal Address: